Learning Goals: Students will be able to explain how the mass of an object is determined using spring balances. Then they will be able to use the spring balance to determine the mass of an unknown object.

Directions: Investigate how the simulation works by "mousing around." Then, use the tools to determine the masses of the three unmarked cylinders. You will turn in a paper that has 3 parts.

1. Go to the PhET site(http://phet.colorado.edu), launch *Masses and Springs*

2. Using Spring 1 or Spring 2 follow the steps below:

3. Make a data table that includes information that you used to determine the mass of the unknowns. Record the determined masses in the table as well.

4. Write a procedure that another student could follow to verify your results. The procedure should be in paragraph form and be in third person.

5. Write a paragraph that explains your reasoning for the procedure design.

6. Write a Linear Equation that scientist can use to find the weight of an unknown mass by examining the "stretchiness" of the spring.

7. Now use a spring with a different stiffness (this will require you to use Spring 3 and make an adjustment), then repeat steps 3 through 6.

8. Explain what is different about your equations for the two equations you derived.

9. Come up with a law or equations that will hold true for both of your springs.

    - Extra Credit: find out if a European Physicist has already named the law you have discovered and named!

Simulation helpful tips: All the springs have the same characteristics by default. The stiffness of spring number **three** can be varied; put the slider in the middle to reset.